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ZOÖLOGY.

Goette's Zoology.¹—In its general appearance and make up this work is of the familiar type. There are few novelties in it, and it is largely morphological and systematic in character. It begins with an Introduction which, in the inadequate space of twenty-five pages, discusses the basis of classification, analogy and homology, cells and protoplasm, the history of zoölogy and the theory of evolution. The rest of the volume is devoted to the systematic discussion. In this part the usual treatment is adopted and there are few features which call for comment. It is a pleasure to note that the author has not been ultra conservative. Thus we find a recognition of the close relationships of Crustacea and Arachnida, these being united in a group Cephalothoracica. The Phyllopoda are regarded as the primitive Crustacea, and the group of Chordata is admitted, without however including the Enteropneusta. Even in details the work seems up to date as for instance (p. 343) in the denial of the vertebrate gonotome, and in the recognition of two kinds of ribs.

The language is simple and easy, and the illustrations, largely original or redrawn by the author, are clear and illustrative. One feature, however, demands criticism. The author is apparently one of those who thinks it a gain to science to rename things already well named. Thus we find Monoplastida and Polyplastida for Protozoa and Metazoa, Eucephalica for Insecta, Pinnata for Pisces, Digitata for Tetrapoda, Ditremata for Placentalia, etc. Surely such increase in synonymy can serve no useful end. The Metazoa are divided into Radiata, including sponges and cœlenterates, and Bilateralia, and the latter group into Hypogastrida, including the Vermes, Mollusca and Arthropoda, and the Pleurogastrida, composed of Vermiformia (Sagitta, Balanoglossus) Echinodermata, and Chordata. The work is devoted almost exclusively to recent forms and extinct groups receive but slight notice.

K.

A New System of Zoögeography has been invented by Prof. Simroth of Leipzig,² which, however, is not altogether original with him, P. Reibisch³ having first propounded the fundamental idea. The latter is as follows.

¹ Lehrbuch der Zoologie von Dr. Alexander Goette. Leipzig 1902. Svo, pp xii+504.

² Simroth, H. Ueber das natuerliche System der Erde, *Verhandl. deutsch. Zoölog. Gesellsch.* 1902. p. 19-42.

³ Reibisch, P. Ein Gestaltungsprincip der Erde, *27. Jahresber. Ver. f. Erdkunde Dresden.* 1901. p. 105-124.

There exists *one largest* axis of the earth, ending at two points under the equator, and this is due to the fact that the diameter of the equatorial belt, which is larger than any other, is increased by high mountains situated at these points, which are in Ecuador on the one side, and in Sumatra on the other.

These two points, according to Reibisch and Simroth, were situated under the equator throughout all of the earth's history, while all other points of the present equator oscillate toward the north and south, that is to say, they shift their position in consequence of a slow oscillation of the poles in a direction marked by a meridian that goes through Bering Sea on the one side, and through Europe and Africa on the other.

Reibisch tries to support his views by a collection of facts showing repeated subsidence and elevation of certain parts of the earth's surface: this demonstration, however, is entirely insufficient to found upon it a theory of this importance, and moreover, the burden of the proof does not rest with Geology, but with Physics and Astronomy. The latter branches have been entirely neglected by Reibisch as well as Simroth, and thus their theory of this peculiar "oscillation" of the Poles lacks proper support, we may even say, has no support at all, since the geological evidence introduced by Reibisch is by far too scanty and superficial, and even in some cases incorrect.

Now, this assumption of an oscillation of the Poles in a straight line, the North Pole moving alternately toward Europe and toward Bering Strait, of which movement the earth-axis from Ecuador to Sumatra forms the pivot, is sufficient for Simroth to explain many problems of the earth's history and of the distribution of animals.

It is hardly worth while to discuss Simroth's ideas *in extenso*, since the zoögeographical material introduced by him is far from being adequate. Generally, we may say that the facts quoted are indifferent with respect to his theory, sometimes the facts are misunderstood, and in other cases they are directly incorrect or even absurd. The same is true of the facts quoted from Geology or Physical Geography, of which branches Simroth seems to possess hardly the most superficial knowledge,¹ and his ideas as to the descent of some animals are sometimes ridiculous in the highest degree.²

¹ I mention only his view that Africa does not belong properly to the earth, but is a former second moon that fell upon it. Another instance is that Simroth believes there is a continuous mountain chain from Ecuador to Alaska.

² The worst case is, that he believes the porpoise of the Amazonas river to be a descendant of some Chironectes-like marsupial.

To sum it up, Reibisch has propounded a theory that appears very improbable from the points of view of Physics and Astronomy. It is supported chiefly by imaginary evidence that exists exclusively in the fancy of the author, the few instances that might be relied upon being so scarce and so ambiguous that they cannot furnish any base for a theory of so far-reaching consequences. Thus it is impossible at all to seriously discuss this theory.

Simroth has used this absurd theory for the creation of a zoögeographical scheme. His demonstration that the distributional facts correspond to his assumptions is a complete failure, due chiefly to a lack of adequate knowledge of the respective facts. And further, Simroth's paper is written in so superficial a way for so important a subject, that we must express our astonishment at this lack of truly scientific spirit: we do not want scientific dreams and fancies, but actual, solid and faithful work.

A. E. O.

Gardiner's Maldives.¹—The third part of J. Stanley Gardiner's *Fauna and Geography of the Maldivé and Laccadive Archipelagoes* is at hand. It contains six memoirs.

The first is by F. Jeffrey Bell on the "Actinogonidiæ Echinoderms." He describes five species of *Antedon*, 5 of *Actinometra*, 13 *Asteroidea*, 12 *Ophiruoidea* and 15 *Echinoidea*. The collection is of the ordinary coral-reef type and consists very largely of young forms. Many of the *Ophiruoidea* have lost the upper surface of the disc and Bell suggests that the gonads are set free by the separation of the disc.

The Orthoptera are described by Malcolm Burr. Almost all are cosmopolitan or widely distributed oriental species, probably all occurring also in India or Ceylon. The 24 species include one of the *Forficulæ*, five of the *Blattodea*, one of the *Mantodea*, seven of the *Acridiodea*, four of the *Locustodea* and six of the *Gryllodea*. The commonest grasshopper, *Epacromia tamulus Fabr.*, is found abundantly throughout the Oriental region.

Borradaile gives an account of "The Xanthidæ and some other crabs" and this, like his earlier papers, is an invaluable contribution to the bionomics of species which have hitherto been known chiefly from alcoholic material. Although he is not able to explain on the ground of adaptation every feature of the different species Borradaile

¹Gardiner, J. Stanley. *The Fauna and Geography of the Maldivé and Laccadive Archipelagoes*, Vol. i, Part iii. Plates XIV–XVII and text illustrations 41–71, pp. 223–346.